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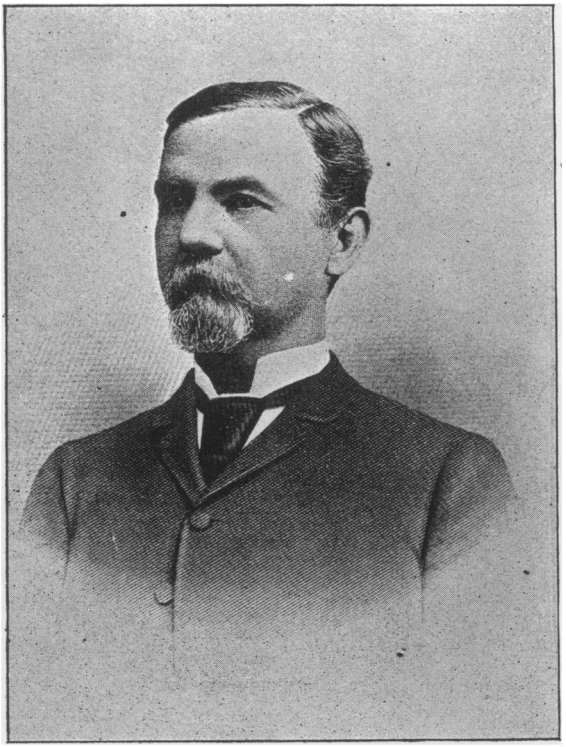
BIOGRAPHY.

COL. JAMES W. NICHOLSON.

Few persons in the South have acquired a more enviable reputation in their profession than Col. James W. Nicholson, the accomplished president and professor of Mathematics in the Louisiana State University and Agricultural and Mechanical College. This reputation is largely due to his mathematical attainments, which are fast becoming recognized throughout the scientific world and to the general ability and fidelity with which he has invariably discharged the various duties and trusts committed to him. Col. Nicholson was born in Macon county, Ala., June 16, 1844, but is to all intents a native of Louisiana, since his father, W. B. Nicholson, moved with his family to Claiborne parish, La., only six months after the birth of his son, and has continued to reside there ever since. The family connections in the northern portion of the state are very numerous on the maternal side, and include numerous names closely identified with the history of the State. Colonel Nicholson's early training was largely under the guidance of Prof. J. W. Boring, who prepared him for his admission to the freshman class of Homer college at the age of fourteen years. He was probably fairly well prepared for admission. He had inherited a robust constitution, in fact he is at the present time a model of physical health. His moral nature has been developed as is usual in Christian families and Christian communities along vigorous, healthful lines, and his intellectual advancement was fully up to the requirements of the college which he entered which were by no means of a low order. The college at this time was under the management of such men as Rev. Baxter Clegg, John W. Stacy, John B. Gretter and Professor Simmons, whose only view of an education was that it was intended to develop rather than to adorn men, and all of whose methods and processes were directed to this end. Under the guidance of such men as these a young man of Mr. Nicholson's bent and genius was sure to develop rapidly. Even



Col. James W. Nicholson.

during his preparatory course he had shown a strong preference for the study of mathematics, and a singular aptitude in the mastery of its principles. Details he cared but little about for the trend of his mind from the beginning was toward originality—generalizations. The usual methods of solution and a demonstration served to merely stimulate him to search for new and unusual methods of reaching the same results.

It is said that he never received any aid in the solution of a mathematical question, nor a single demerit for misconduct, while at college. His devotion to mathematical study did not, however, prevent his taking a fair stand in his classical studies. But his course of study was not to be completed at this time. To him as to other young men in our college in the year 1861, the sound of war's alarm was the call of a higher duty.

While still in his sixteenth year, and with but a single year more to study before graduation, he entered the confederate army in 1861 as a private in Company B, Twelfth Louisiana infantry, under Col. Thomas M. Scott, and served without interruption until the close of the war, and until surrendered at Greensboro, N. C., only twenty-three days less than four years from the date of his enlistment. It is doubtless due to his extreme youth (and his continued occupation of study even during the war) that he achieved no marked distinction among the brave fellows by whom he was surrounded, most of whom were by many years his seniors.

He was, however, elected second sergent of his company at Camp Green, Tenn., in the spring of 1862, in that capacity participated in many of the great battles of the war. Having returned home after the war, his first thought was for a profession in life, and at first his mind turned toward the law, and its study was commenced under the guidance of the late Judge W. B. Eagan, of Homer, La. This study was, however, of brief duration, for a vacancy occurring, or rather being, for it was in the period of reconstruction, in the chair of the professor of mathematics in Homer College, he was induced to fill it temporarily and continued to fill it for the term of two years. During these two years his old love for mathematical study which had never quite left him returned with full force, and finding teaching congenial, he resolved to make it his profession for life. About six miles from Homer, the home of his boyhood, in the little town of Arizona, an enterprise, most unusual in this section, had sprung into being. A company had been organized, a large cotton factory had been built, and a little village was springing into life around it. This seemed to young Nicholson a fine opening for a school, and he accordingly gave up his position in Homer college and started a new school in the fall with forty-five students, which number soon increased to 125 and the success of the new enterprise was assured. But his *alma mater* had not done with him yet.

In 1870 he was elected professor of mathematics in Homer college at a salary of $1,500 per annum. The school at Arizona, still his property, did not flourish, however, after he had left it, as it had done under his immediate management, and in the winter of 1872 he was compelled to give up the college

professorship and resume charge of the school in order to save his property. For the next five years he labored incessantly, the school surviving even the failure of the industrial venture upon which the life of the village of Arizona depended, meanwhile devoting himself with increasing ardor to the study of mathematics and consequently adding both to his knowledge and his reputation as a student in that branch of study in which in after years he was destined to acquire distinction.

During the summer of 1877 upon the re-organization of the Louisiana State University and Agricultural and Mechanical College, which institutions had just been united into one, Professor Nicholson was elected to the chair of mathematics in this university, which stands at the head of the public school system of the state.

This position he has ever since continued to fill with credit to himself, the institution and the state. On April 3, 1883, Col. William Preston Johnson, then president of the Louisiana State University, having resigned the presidency of Tulane University at New Orleans, Professor Nicholson was elected president of the university in which he still continues to hold the chair of mathematics, discharging with great facility and efficiency the duties of both positions, either one of which would have taxed the energies of a less vigorous man. But his even temperament and firm constitution fit him to accomplish tasks beyond the powers of the average man, and the work of the president and the instructor alike prospered in his hands. This being a military school, the new rank of colonel was conferred upon him by the governor, a title which in this military age seems to be more generally recognized than those which testify to civic honors of greater worth, consequently, instead of Professor Nicholson or President Nicholson he is generally accosted as Colonel Nicholson. But whether as professor or president or Colonel, honor seems to sit lightly upon him, and he is the same genial companion, wise counselor and sympathetic friend. His administrative capacity is of high order. Full of expedients, his mind being always on his work and his heart in it, the school over which he presides is never allowed to stagnate, or to become disorderly. As in his mathematics, so here the solution of the problems may not be expected or usual, but they are sure to be prompt, vigorous, and effective. His magnetic nature draws hearts to him and there are few among either pupils or associates who do not esteem him as a friend.

The position of president of the State University, Col. Nicholson still (1894) occupies and has continued to occupy (with a brief interval) since his election in 1883, as stated above.

As Colonel Nicholson's reputation is chiefly that of a mathematician, this sketch would be imperfect without special mention of him in this particular, and of some of the contributions which he has made to mathematical science. As already intimated he has an independent, inventive and progressive mind, always more disposed to invent new methods than to passively follow old ones, and as a consequence he has extended in several lines of first importance the scope of mathematical inquiry, and his merit has been recog-

onized by the foremost mathematicians of the world. He is a member of the London Mathematical Society (England), and also of the Mathematical Society, of New York. A partial list of his mathematical works, formulas, etc., is as follows:

He has been a contributor to most of the mathematical journals of the country. He is the discoverer of the following singular value of π: $\pi=2\div[(1-1)^{\frac{1}{2}}(1-1)^{-\frac{1}{2}}]$; and also of the following: $\cos\phi=\frac{(-1)^{\frac{\phi}{\pi}}+(-1)^{-\frac{\phi}{\pi}}}{2}$ and $\sin\phi=\frac{(-1)^{\frac{\phi}{\pi}}-(-1)^{-\frac{\phi}{\pi}}}{2\sqrt{-1}}$.

A series of arithmetics and an elementary algebra, adopted and in exclusive use in the public schools of Louisiana. Also a treatise on "Isoperimetrical Geometry" in 1869, one on the Calculus of Finite Differences" in 1871,one on Directed Quantities in 1885, etc. His method of developing the last named subject, which is a new method of imaginaries, is entirely different from that of Argand or Hamilton, and the author thinks of publishing the same at an early day. In 1868 he published a pamphlet on the "Trigonometrical Circle," a formula which he devised for expressing the relation between the sides and functions of the angles of right angled triangles, which has been incorporated into some of the standard works on trigonometry, and taught in some of the best colleges and universities in this country and Europe. In 1880 he published a pamphlet entitled "A New and Complete Demonstration of the Bonomial Theorem" which has received the highest commendation from mathematicians. He published a pamphlet on the "Multisector," an instrument which he has invented for dividing an angle into any number of equal parts. A meritorious paper of his on "a simple and direct method of separating the roots of ordinary equations" was read before the Mathematical Society, of New York, May 7, 1892. His last great contribution to mathematics is "A Direct and General Method of finding the Real Roots of Numerical Equations to any Degree of Accuracy."

He has just finished the manuscript of a work on the Differential and Integral Calculus on a *new plan or theory*, which will be printed and ready for use in a few months.

The degree of LL. D. was conferred on Col. Nicholson by the A. and M. College, Ala., in 1893.

Col. Nicholson married in Clairborne parish, July 30, 1876, Miss Sallie D. Baker, a native of that parish, the daughter of Capt. James C. Baker, a native of Georgia, a captain in the confederate army. By this marriage Colonel Nicholson has five children: Gordon, Lilburne,Malcolm Dudley,Wilbur Fenner, and Annie. Both Colonel Nicholson and his wife are members of the Methodist church. Col. Nicholson is a liberal patron of art, and nothing affords him more pleasure than to study the faces and lives of the masters among men, for which he is firm in the philanthropy of his religion, he believes man to be the crowning work of creation, whose destiny is worthy

the study and toil of ages. In all this he holds the noblest of all possessions, a brave, intelligent, and trusting wife, whose sympathy and encouragement is a constant incentive to him to work on, to penetrate still deeper in the hidden mysteries of his laborious science. He is tall, being five feet eleven inches in height, and weighs 185 pounds. He has light grayish blue eyes and a face which leaves the impression of power and capacity.

[Erratum. Page 185, beginning of 16th line from the top of page, insert "to accept the presidency".]

SOME NOVEL AND INTERESTING FORMULAS.

By J. W. NICHOLSON, A. M., LL. D., Member of the London, and New York Mathematical Societies, and President and Professor of Mathematics, Louisiana State University, Baton Rouge, Louisiana.

These formulas are given without demonstration, thinking that their deduction would occupy more space than they probably deserve.

$$(2a+2b)^2+a^2+b^2=(2a+b)^2+(a+2b)^2\ldots\ldots(1).$$

This is a simple formula for finding three square numbers whose sum is equal to the sum of two squares. Thus, for $a=5$, $b=3$, we have

$$16^2+5^2+3^2=13^2+11^2\ldots\ldots(2).$$

$$(3a+3b)^n+(2a+4b)^n+a^n+b^n=(3a+4b)^n+(a+3b)^n+(2a+b)^n\ldots\ldots(3),$$

where $n=3$, 2 or 1.

Thus, for $a=5$, $b=3$, we have $24^n+22^n+5^n+3^n=27^n+14^n+13^n\ldots.(4)$, where $n=3$, 2 or 1.

$$(5a+10b)^n+(4a+11b)^n+(3a+5b)^n+(2a+8b)^n+(3a+3b)^n+(2a+6b)^n+a^n+b^n=(5a+11b)^n+(4a+6b)^n+(3a+10b)^n+(3a+8b)^n+(a+5b)^n+(2a+3b)^n+(2a+b)^n\ldots.(5),$$

where $n=5$, 4, 3, 2 or 1.

Thus for $a=5$, $b=2$, we have

$$45^n+42^n+26^n+25^n+22^n+21^n+5^n+2^n=47^n+35^n+32^n+31^n+16^n+15^n+12^n\ldots.(6),$$

where $n=5$, 4, 3, 2 or 1.

In (5) for $a=8$, $b=3$, we find $15^n+10^n+9^n+6^n=14^n+13^n+7^n+3^n+2^n+1^n\ldots.(7)$, where $n=5$, 3 or 1.

$$(a+32)^n+(a+24)^n+(a+18)^n+(a+10)^n+(a+4)^n+(a-4)^n+(a-10)^n+(a-18)^n+(a-24)^n+(a-32)^n=(a+30)^n+(a+28)^n+(a+16)^n+(a+8)+^n(a+6)^n+(a-6)^n+(a-8)^n+(a-16)^n+(a-28)^n+(a-30)^n\ldots.(8),$$

where $n=5$, 4, 3, 2 or 1.

In (8) by making $a=7$, we find

$$39^n+31^n+21^n+9^n=37^n+35^n+15^n+13^n\ldots.(9),$$

where $n=5$, 3 or 1.

$$j=|\underline{n}=n^n-n(n-1)^n+\frac{n(n-1)}{2}(n-2)^n-\frac{n(n-1)(n-2)}{2.3}(n-3)^n+\&c.\ldots.(10),$$

where n is any positive integer.